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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,662	01/28/2002	Ryoichi Mukai	2500.66134	3822

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EXAMINER	
PIZIALI, ANDREW T	
ART UNIT	PAPER NUMBER
1771	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/058,662	MUKAI, RYOICHI	
	Examiner	Art Unit	
	Andrew T. Piziali	1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-6 and 19-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-6 and 19-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *5/26/05 & 1/28/02* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/20/2006 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 4-6 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,846,648 to Chen in view of USPN 6,602,621 to Matsunuma.

Regarding claims 1, 4, 6 and 19-21, Chen discloses a polycrystalline structure film comprising metallic islands (74) formed on a surface of a substrate (12), a seed crystal layer (24) containing crystal grains (76) having grown from a corresponding one of the metallic islands, and a magnetic crystal layer (16) containing magnetic crystal grains (78), each of the magnetic crystal grains having grown from a corresponding one of the crystal grains of the seed crystal layer (see entire document including Figure 2, column 8, lines 15-48, column 9, lines 14-65, column 10, lines 7-39, column 11, lines 11-22, the paragraph bridging columns 11 and 12, and column 16, lines 9-46).

Figure 2 of Chen does not appear to illustrate the islands (74) as being physically spaced from each other, but Chen specifically discloses that the islands (also known as the nucleation sites, see column 17, lines 57-60) are to be spaced to provide a method for optimizing the segregation of segregant material at the grain boundaries in the magnetic layer (column 8, lines 39-48 and column 18, lines 7-16).

In the event that it is shown that Chen does not disclose the claimed physically spaced islands with sufficient specificity, the invention is obvious because Chen discloses that it is understood by one of ordinary skill in the art that the spacing determines properties such as high coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite (column 2, lines 24-31, column 8, lines 15-48, column 9, lines 14-26, column 12, lines 29-41, and column 16, lines 9-46). It would have been obvious to one having ordinary skill in the art at the time the invention was made to physically space the islands, because the spacing determines properties such as high coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite, and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Chen does not appear to specifically mention the metallic islands (nucleation sites) including atoms of at least one metallic element and molecules of a compound selected from an oxide or a nitride, but Chen discloses that the nucleation sites may be formed of any material that allows for the epitaxial growth of the recording layer (column 10, lines 6-22). Matsunuma discloses that it is known in the magnetic recording art to use a material including atoms of at least one metallic element, such as Pt and Co, and molecules of a compound, such as SiN (see entire document including column 4, lines 18-65). It would have been obvious to one having

ordinary skill in the art at the time the invention was made to make the metallic islands from any suitable material, such as Pt, Co, and SiN, as taught by Matsunuma, because the resulting structure would possess reduced transition noise and/or high S/N and because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability and desired characteristics.

Regarding claim 6, Matsunuma discloses that the compound may be present in a range of between 5at% and 20at% (column 4, lines 42-65).

Regarding claims 19 and 20, Chen discloses that each or the crystal grains (78) of the magnetic crystal layer (16) are separated from another crystal grain of the magnetic crystal layer at a grain boundary (see Figure 2). Chen also discloses that the crystal grains of the magnetic crystal layer are made of cobalt and platinum (column 15, lines 5-10). Chen does not appear to specifically mention chromium atoms diffusing along the grain boundary, but considering that the crystal grains of the magnetic crystal layer comprise chromium (column 15, lines 5-10), and considering that the underlying intermediate layer is made of chromium atoms (column 11, lines 11-21), it appears that chromium atoms inherently diffuse along the grain boundary and form a wall of chromium atoms.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to

obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977).

4. Claims 1 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,846,648 to Chen in view of USPN 6,620,533 to Hikosaka.

Regarding claims 1 and 19-21, Chen discloses a polycrystalline structure film comprising metallic islands (74) formed on a surface of a substrate (12), a seed crystal layer (24) containing crystal grains (76) having grown from a corresponding one of the metallic islands, and a magnetic crystal layer (16) containing magnetic crystal grains (78), each of the magnetic crystal grains having grown from a corresponding one of the crystal grains of the seed crystal layer (see entire document including Figure 2, column 8, lines 15-48, column 9, lines 14-65, column 10, lines 7-39, column 11, lines 11-22, the paragraph bridging columns 11 and 12, and column 16, lines 9-46).

Figure 2 of Chen does not appear to illustrate the islands (74) as being physically spaced from each other, but Chen specifically discloses that the islands (also known as the nucleation sites, see column 17, lines 57-60) are to be spaced to provide a method for optimizing the segregation of segregant material at the grain boundaries in the magnetic layer (column 8, lines 39-48 and column 18, lines 7-16).

In the event that it is shown that Chen does not disclose the claimed physically spaced islands with sufficient specificity, the invention is obvious because Chen discloses that it is understood by one of ordinary skill in the art that the spacing determines properties such as high coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite (column 2, lines 24-31, column 8, lines 15-48, column 9, lines 14-26, column 12, lines 29-41,

and column 16, lines 9-46). It would have been obvious to one having ordinary skill in the art at the time the invention was made to physically space the islands, because the spacing determines properties such as high coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite, and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Chen does not appear to specifically mention the metallic islands (nucleation sites) including atoms of at least one metallic element and molecules of a compound selected from an oxide or a nitride, but Chen discloses that the nucleation sites may be formed of any material that allows for the epitaxial growth of the recording layer (column 10, lines 6-22). Hikosaka discloses that it is known in the magnetic recording art to use a material including atoms of at least one metallic element, such as Pt and Co, and molecules of a compound, such as an oxide or nitride (see entire document including claim 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the metallic islands from any suitable material, such as Pt, Co, and an oxide or nitride, as taught by Hikosaka, because the resulting structure would possess improved recording resolution, improved resistance to thermal decay, and/or high S/N and because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability and desired characteristics.

Regarding claims 19 and 20, Chen discloses that each or the crystal grains (78) of the magnetic crystal layer (16) are separated from another crystal grain of the magnetic crystal layer at a grain boundary (see Figure 2). Chen also discloses that the crystal grains of the magnetic crystal layer are made of cobalt and platinum (column 15, lines 5-10). Chen does not appear to specifically mention chromium atoms diffusing along the grain boundary, but considering that

the crystal grains of the magnetic crystal layer comprise chromium (column 15, lines 5-10), and considering that the underlying intermediate layer is made of chromium atoms (column 11, lines 11-21), it appears that chromium atoms inherently diffuse along the grain boundary and form a wall of chromium atoms.

5. Claims 1, 4 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,846,648 to Chen in view of USPN 5,631,094 to Ranjan.

Regarding claims 1, 4 and 19-20, Chen discloses a polycrystalline structure film comprising metallic islands (74) formed on a surface of a substrate (12), a seed crystal layer (24) containing crystal grains (76) having grown from a corresponding one of the metallic islands, and a magnetic crystal layer (16) containing magnetic crystal grains (78), each of the magnetic crystal grains having grown from a corresponding one of the crystal grains of the seed crystal layer (see entire document including Figure 2, column 8, lines 15-48, column 9, lines 14-65, column 10, lines 7-39, column 11, lines 11-22, the paragraph bridging columns 11 and 12, and column 16, lines 9-46).

Figure 2 of Chen does not appear to illustrate the islands (74) as being physically spaced from each other, but Chen specifically discloses that the islands (also known as the nucleation sites, see column 17, lines 57-60) are to be spaced to provide a method for optimizing the segregation of segregant material at the grain boundaries in the magnetic layer (column 8, lines 39-48 and column 18, lines 7-16).

In the event that it is shown that Chen does not disclose the claimed physically spaced islands with sufficient specificity, the invention is obvious because Chen discloses that it is understood by one of ordinary skill in the art that the spacing determines properties such as high

coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite (column 2, lines 24-31, column 8, lines 15-48, column 9, lines 14-26, column 12, lines 29-41, and column 16, lines 9-46). It would have been obvious to one having ordinary skill in the art at the time the invention was made to physically space the islands, because the spacing determines properties such as high coercivity, high squareness, low noise, proper segregation spacing, and improved overwrite, and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Chen does not appear to specifically mention the metallic islands (nucleation sites) including atoms of at least one metallic element and molecules of a compound selected from an oxide or a nitride, but Chen discloses that the nucleation sites may be formed of any material that allows for the epitaxial growth of the recording layer (column 10, lines 6-22). Ranjan discloses that it is known in the magnetic recording art to use a material including atoms of at least one metallic element, such as Ni, and molecules of a compound, such as Al_2O_3 (see entire document including column 6, lines 10-28). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the metallic islands from any suitable material, such as Ni_3P and Al_2O_3, as taught by Ranjan, because the resulting structure would possess improved corrosion resistance, higher coercivity, higher saturation magnetization, and/or higher squareness, and because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability and desired characteristics.

Regarding claims 19 and 20, Chen discloses that each or the crystal grains (78) of the magnetic crystal layer (16) are separated from another crystal grain of the magnetic crystal layer at a grain boundary (see Figure 2). Chen also discloses that the crystal grains of the magnetic

crystal layer are made of cobalt and platinum (column 15, lines 5-10). Chen does not appear to specifically mention chromium atoms diffusing along the grain boundary, but considering that the crystal grains of the magnetic crystal layer comprise chromium (column 15, lines 5-10), and considering that the underlying intermediate layer is made of chromium atoms (column 11, lines 11-21), it appears that chromium atoms inherently diffuse along the grain boundary and form a wall of chromium atoms.

Response to Arguments

6. Applicant's arguments have been considered but are moot in view of the new grounds of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Piziali whose telephone number is (571) 272-1541. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

atp

2/5/07
ANDREW PIZIALI
PRIMARY EXAMINER